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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,748	03/14/2006	Micheal J. Petrillo	PHUS030359US	1212
38107 7590 09/06/2007 PHILIPS INTELLECTUAL PROPERTY & STANDARDS 595 MINER ROAD CLEVELAND, OH 44143			EXAMINER IGYARTO, CAROLYN	
			ART UNIT 2884	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/571,748

Applicant(s)

PETRILLO ET AL.

Examiner

Carolyn Igyarto

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>14 March 2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

1. Priority to PCT/IB04/51655 and US provisional application 60/505,538. A certified copy of US provisional application 60/505,538 has been received.

### ***Information Disclosure Statement***

2. The information disclosure statement submitted on March 14, 2006 has been considered by the Examiner and made of record in the application file.

### ***Response to Amendment***

3. The preliminary amendments to the specification and claims filed on March 14, 2006 were accepted and entered. Claims 1-17 were amended to remove reference characters. Claims 18-20 are added.

### ***Oath/Declaration***

4. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The last inventor's, John F. Vessel, signature does not appear in the "inventor's signature" line.

### ***Specification***

5. The disclosure is objected to because of the following informalities:
6. Many of the reference characters in the specification do not properly correlate to the figures. The specification and figures should be revised carefully to correct the numerous errors. Examples of reference characters that do not properly correlate are: 26 and 28.
7. Page 4, line 27 recites "The substrate 40"; instead "The substrate (circuit board) 40" should be recited, because previously reference character 40 is used to refer to a circuit board.

Appropriate correction is required.

### ***Claim Objections***

8. Claim 6 is objected to because of the following informalities: Line 2 recites "the aligning means." However, "aligning means" is not previously recited. Appropriate correction is required.
9. Claim 17 is objected to because of the following informalities: lines 2-3 recite "mounting the collimator." "The collimator" lacks antecedent basis. Appropriate correction is required.

10. Claim 19 is objected to because of the following informalities: "the detector modules" lack antecedent basis. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "socket" in claims 1-12 is used by the claims to mean "a platform", while the accepted meaning is "an opening or hollow that forms a holder for something." The term is indefinite because the specification does not clearly redefine the term.

14. Claims 9 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

15. The terms "relatively soft", "sufficiently soft to tend to bend", and "precise cross section" in claims 9 and 13 are relative terms, which renders the claim indefinite. The

terms "relatively soft", "sufficiently soft to tend to bend", and "precise cross section" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

***Claim Rejections - 35 USC § 102***

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 1-2 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Lingren et al. (EP 1249713), hereinafter referred to as Lingren.

18. With respect to **claims 1 and 10**, Lingren teaches a detector and method for assembling a detector for a nuclear imaging system ([0029] lines 3-4), the detector comprising:

a plurality of sockets (214; [0030] lines 1-2, Each module 206 includes a carrier 214 as seen in Fig. 3a.) which each support an array of individual detector elements (Fig. 3a), each socket including:

a plurality of electrical connectors ([0037] lines 1-2; [0041] lines 2-3), and

a socket alignment structure ([0041] lines 2-4);

a circuit board (208) for receiving sockets ([0030] lines 1-3), which circuit board includes:

a plurality of electrical connection means which electrically connect with the electrical connectors ([0029] lines 5-6; [0037] lines 1-2; [0041] lines 2-4), and

a circuit board alignment structure which mates with the socket alignment structure to align the sockets and the individual detector elements to the circuit board ([0041] lines 2-4); and

a means for mounting a collimator to the circuit board in alignment with the circuit board ([0027] lines 3-4; Fig. 2).

19. With respect to **claim 2**, Lingren teaches the socket alignment structure and the mating circuit board alignment structure includes rigid pins and apertures of like cross-section ([0048] lines 2-3; [0051] lines 1-2).

20. With respect to **claim 8**, Lingren teaches the socket alignment structures includes rigid pins positioned diagonally from each other (Fig. 3a).

21. With respect to **claim 9**, Lingren teaches the connectors are pins of relatively soft metal that tend to deform as the sockets are received on the circuit board (soldered [0049] lines 1-2).

***Claim Rejections - 35 USC § 103***

22. Claims 4-6, 11-12, and 18-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lingren et al. (EP 1249713), hereinafter referred to as Lingren.

23. With respect to **claim 4 and 11**, Lingren teaches, the collimator mounting means includes a frame ([0033] lines 1-2) and further including: an aligning means for aligning the frame and the circuit board ([0033] lines 1-2) and the collimator is mounted in a fixed alignment (Fig. 2). In the alternative, if it is held that Lingren does not teach the housing to surround the collimator (or the mounting means includes a frame) it would have been obvious to one of ordinary skill at the time of the invention to have the housing surround the collimator on the sides for the benefit of preventing stray radiation from adversely affecting the acquired image ([0032] line 3).

24. With respect to **claims 5 and 12**, Lingren teaches the individual detector elements are separated by interfaces or gaps (lines of separation 216; Fig. 3a) and wherein the collimator includes mechanical elements which define a plurality of apertures ([0027] line 4; collimators include a plurality of apertures, especially when an imaging device having a plurality of pixels is receiving the energy that is passing through the apertures), the mechanical elements being aligned with the interfaces or gaps such that the apertures are centered on and aligned with the individual detector elements (inherently, the collimator apertures and pixel centers are aligned providing the system with improved resolution). In the alternative, if it is held that Lingren does



not inherently teach the collimator having a plurality of apertures or the apertures of the collimator being aligned with the center of the pixels; It would have been obvious to one of ordinary skill at the time of the invention to include a plurality of apertures in the collimator for the benefit of broadening the area being imaged at any given time. Also, It would have been obvious to one of ordinary skill at the time of the invention to align the apertures of the collimator with the center of the pixels for the benefit of increasing the resolution of the system.

25. With respect to **claim 6**, Lingren further teaches the aligning means includes: at least two alignment holes defined in the frame, and at least two matching holes defined in the circuit board ([0033] lines 1-2).

26. With respect to **claim 18**, Lingren teaches a detector for a nuclear imaging system ([0029] lines 3-4), the detector comprising:

- a plurality of detector elements (detector elements 212) selectively securable to a circuit board ([0049] lines 4-6), the detector elements being separated by gaps (lines of separation 216);

- a collimator comprising mechanical elements which define a plurality of apertures ([0027] line 4); and

- a collimator alignment mechanism, said collimator alignment mechanism aligning the mechanical elements with the gaps separating the detector elements such that the apertures are aligned with the detector elements (Fig. 2).

27. In the alternative, if it is held that Lingren does not inherently teach the collimator having a plurality of apertures or the apertures of the collimator being aligned with the

center of the pixels; It would have been obvious to one of ordinary skill at the time of the invention to include a plurality of apertures in the collimator for the benefit of broadening the area being imaged at any given time. Also, It would have been obvious to one of ordinary skill at the time of the invention to align the apertures of the collimator with the center of the pixels for the benefit of increasing the resolution of the system.

28. With respect to **claim 19**, Lingren further teaches a detector element alignment mechanism, said detector element alignment mechanism aligning the detector modules on the circuit board ([0041] lines 2-4).

29. With respect to **claim 20**, Lingren teaches each aperture is aligned with an individual detector element ([0027] line 4). In the alternative, if it is held that Lingren does not inherently teach each aperture is aligned with an individual detector element; it is well known in the art to have each aperture of a collimator correspond and be position with individual detector elements, for the benefit of increasing resolution. Therefore, it would have been obvious to one of ordinary skill at the time of the invention to have each aperture of the collimator taught by Lingren to be aligned with an individual detector element for the benefit of increasing resolution.

30. Claims 13-14 are rejected under 35 U.S.C. 102(b) as anticipated by Orava et al. (US 5,955,733), hereinafter referred to as Orava, or, in the alternative, under 35 U.S.C. 103(a) as obvious.

31. With respect to **claim 13**, Orava teaches a detector for a nuclear imaging system (col. 1, lines 9-10 and 16-17), the detector comprising:

a substrate including a plurality of sets of electrically conductive holes (col. 5, lines 19-23) and alignment holes of precise cross section (col. 5, lines 40-42); and

a plurality of detector modules (col. 4, lines 28-32) each detector module including a plurality of electrically conductive connection pins which are sufficiently soft to tend to bend (col. 5, lines 16-23 and 46-47; col. 6, lines 65-67) and rigid alignment pins of the precise cross section (col. 5, lines 40-43), each set of holes being configured to receive one of the modules (col. 5, lines 16-23 and 40-43).

32. In the alternative, if it is held that Orava does not inherently teach the electrically conductive connection pins to be sufficiently soft to tend to bend. Orava teaches using a flexible material for the benefit of ensuring that the air pressure differential between the upper and lower surfaces of the device is maintained (col. 5, lines 36-40). Therefore It would have been obvious to one of ordinary skill at the time of the invention to have the electrically conductive connection pins made of a material that is sufficiently soft that tends to bend for the benefit of ensuring that the air pressure differential between the upper and lower surfaces of the device is maintained.

33. With respect to **claim 14**, Orava further teaches each detector module includes: individual detector elements which are electrically connected to the electrically conductive connector pins, the individual detector elements being mounted in a rectangular array separated from each other by a rectangular grid of interfaces (col. 4, lines 55-61; col. 5, lines 15-23; Orava teaches that in a preferred embodiment Active

Semiconductor Imaging Devices as described in PCT/EP95/02056 are used. As seen in Fig. 5 of PCT/EP95/02056 the individual detector elements are configured in a rectangular array including rectangular grid interfaces.).

34. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lingren et al. (EP 1249713), hereinafter referred to as Lingren, as applied to claims 1-2 above, and further in view of Orava et al. (US 5,955,733), hereinafter referred to as Orava.

35. With respect to **claim 3**, Lingren teaches all of the limitations of claims 1-2, as explained above. Lingren further teaches pins having separate functions ([0049] lines 1-2; [0051]; [0052]; Tables 1-2). If it is held that Lingren does not teach any of the pins are not used for transmitting electrical signals between the sockets and the circuit board; Then, Orava teaches the use of pins that are solely used for alignment purposes and are not used for transmitting electrical signals between the socket and the circuit board (col. 5, lines 41-51), for the benefit of increasing stability. Therefore, It would have been obvious to one of ordinary skill at the time of the invention to have some of the pins taught by Lingren be used solely for alignment purposes and not used for transmitting electrical signals between the sockets and the circuit for the benefit of increasing stability.

36. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lingren et al. (EP 1249713), hereinafter referred to as Lingren, as applied to claims 1 and 4-5

above, and further in view of Chu et al. (US 2004/0080952), hereinafter referred to as Chu.

37. With respect to **claim 7**, Lingren teaches all of the limitations of claims 1 and 4-5 or in the alternative all of the limitations of claims 4-5 are taught or made obvious, as explained above. Lingren further teaches the detection modules arranged in a rectangular array ([0048] lines 4-5 and 11).

38. Lingren does not explicitly teach the frame has a rectangular face including: a longer dimension, and a shorter dimension, the at least two frame alignment holes being disposed along the shorter dimension to reduce an effect of thermal dilatation.

39. However, it would have been obvious to one of ordinary skill at the time of the invention to have the housing, or frame, have similar dimensions to the array of detection modules for the benefit of decreasing wasted space and making the system more compact.

40. Chu teaches having two alignment structures of a frame disposed along the shorter dimension for the benefit of decreasing the difficulty in disassembling the frame ([0007] lines 7-8; [0009] lines 6, 9, and 15-16). Therefore, it would have been obvious to one of ordinary skill at the time of the invention to have the at least two frame alignment holes disposed along the shorter dimension in the invention of Lingren for the benefit of decreasing the difficulty in disassembling the frame.

41. Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orava et al. (US 5,955,733), hereinafter referred to as Orava, and further in view of Lingren et al. (EP 1249713), hereinafter referred to as Lingren.

42. With respect to **claim 15**, Orava teaches or makes obvious all of the limitations of claim 13, as explained above. If it is held that Orava does not include a frame or alignment holes attaching the frame to the substrate.

43. Lingren teaches the substrate defines a plurality of substrate alignment holes and further including: a frame which defines alignment holes, which align with the substrate alignment holes for the benefit of preventing stray radiation from affecting the acquired image ([0032] line 3; [0033] lines 1-2).

44. With respect to **claim 17**, Orava does not teach the frame includes a collimator mounting means for mounting the collimator in precise alignment therewith, the collimator including: radiation blocking element that form a rectangular grid which overlays the interface grids of the individual detector elements which are mounted to the substrate when the collimator is mounted in and aligned with the frame that is aligned with the substrate.

45. Lingren teaches using a collimator for the benefit of increasing resolution ([0027] line 4). Therefore it would have been obvious to one of ordinary skill at the time of the invention to include a collimator, as taught by Lingren, in the invention taught by Orava, for the benefit of increasing resolution.

46. If it is held that Lingren, as modified above, does not teach the housing to surround the collimator (or the frame includes a collimator mounting means) it would

have been obvious to one of ordinary skill at the time of the invention to have the housing surround the collimator on the sides for the benefit of preventing stray radiation from adversely affecting the acquired image ([0032] line 3).

47. If it is held that Lingren does not inherently teach the collimator having a plurality of elements or the apertures of the collimator being aligned with the center of the pixels; It would have been obvious to one of ordinary skill at the time of the invention to include a plurality of apertures in the collimator for the benefit of broadening the area being imaged at any given time. Also, It would have been obvious to one of ordinary skill at the time of the invention to align the apertures of the collimator with the center of the pixels for the benefit of increasing the resolution of the system.

48. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Orava et al. (US 5,955,733), hereinafter referred to as Orava, in view of Lingren et al. (EP 1249713), hereinafter referred to as Lingren, as applied to claim 15 above, and further in view of Chu et al. (US 2004/0080952), hereinafter referred to as Chu.

49. With respect to **claim 16**, Orava, as modified above teaches all of the limitations of claim 15, as explained above. Orava further teaches the substrate to be in a rectangular configuration (Fig. 3).

50. Orava does not explicitly teach the frame has a rectangular face which includes: a longer dimension, and a shorter dimension; and the alignment holes including two alignment holes defined in the shorter dimension to reduce an effect of thermal dilatation.

51. However, it would have been obvious to one of ordinary skill at the time of the invention to have the housing, or frame, have similar dimensions to the array of detection modules for the benefit of decreasing wasted space and making the system more compact.

52. Chu teaches having two alignment structures of a frame disposed along the shorter dimension for the benefit of decreasing the difficulty in disassembling the frame ([0007] lines 7-8; [0009] lines 6, 9, and 15-16). Therefore, it would have been obvious to one of ordinary skill at the time of the invention to have the at least two frame alignment holes disposed along the shorter dimension in the invention of Lingren for the benefit of decreasing the difficulty in disassembling the frame.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carolyn Igyarto whose telephone number is (571) 270-1286. The examiner can normally be reached on Monday - Thursday, 7:30 A.M. to 5 P.M. E.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2884

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